

**Commonwealth of Kentucky**  
**Division for Air Quality**  
***REVISED PERMIT STATEMENT OF BASIS***

FINAL

Title V / Synthetic Minor, Construction / Operating

Permit: V-08-004

Western Kentucky University

Bowling Green, KY 42101

July 3, 2008

Lisa Beckham, Reviewer

SOURCE ID: 21-227-00012

AGENCY INTEREST: 11402

ACTIVITY: APE20070001

**SOURCE DESCRIPTION:**

The Division received a renewal application from Western Kentucky University (WKU) on December 5, 2007 and additional information on February 6, 2008. WKU is a public university that operates several indirect heat exchangers to meet the heat demands of its campus. The facility includes 2 coal-fired units (46.6 and 50.5 MMBtu/hr), three larger natural gas-fired units (72.8 MMBtu/hr, 72.8 MMBtu/hr and 20 MMBtu/hr), and numerous small natural-gas fired units (less than 10 MMBtu/hr). There are also numerous emergency generators throughout the campus and a paint spray booth for miscellaneous maintenance surface coating needs. The paint spray booth was previously listed as an emission unit (EU 09) but after a tour of the facility it was determined that the unit qualifies as an insignificant activity, because it is equipped with a properly designed and operated particulate control device and uses less than five gallons per day, verifiable by appropriate records, of air-dried coating material.

This is the facility's initial Title V/Synthetic Minor permit. WKU has requested to change from a Conditional Major source to a Title V/Synthetic Minor source, by increasing the facility's permitted coal usage to 10,000 tons per year, raising the allowable sulfur content of coal to 1% and increasing the source-wide limit on SO<sub>2</sub> to 225 tons per year. This change will give WKU the ability to meet increased heat demand as its campus expands. Additional changes to the facility include the removal of older small indirect heat exchangers and replacement with newer, more efficient units. The source-wide limit on natural gas use remains unchanged at 750,000,000 scf.

On April 14, 2008, WKU submitted an application for a minor revision to the permit. The changes include: the addition of a biodiesel pilot learning laboratory (0.151 MMBtu/hr diesel-fired water heater), replacing the 25kW emergency generator in Jones Jagger Hall with a new 25kW emergency generator (limited to 500 hours of operation per year), and the addition of a ceramics studio spray booth (PTE less than 1,000 lbs/yr of HAPs and less than 5 tpy of non-hazardous regulated air pollutants). All of these changes classify as insignificant activities and have been incorporated into the permit.

On June 2, 2008 WKU submitted an application for 502(b)10/Off permit changes. WKU will be installing a baghouse to control particulate emissions from the facility's two coal-fired boilers (EU 01 and EU 02). Additionally, WKU is switching out the 2.96 MMBtu/hr natural-gas fired boiler (EU 06, EP 6AK) in the Mass Media and Technology Hall with two new 1.8 MMBtu/hr natural-gas fired boilers (EU 06, EP 6AK and EP 6AL). These changes have been incorporated into the permit.

#### **APPLICABLE REGULATIONS AND EMISSION UNITS:**

**401 KAR 59:015**, New indirect heat exchangers, applicable to an emissions unit with a capacity of less than 250 MMBtu/hr which commenced on or after April 9, 1972.

**40 CFR 60, Subpart Dc**, Standards of performance for small industrial-commercial-institutional steam generating units, applicable to each steam generating unit commenced after June 8, 1989 that has a maximum design heat input capacity between 10 and 100 MMBtu/hr.

**40 CFR 60 Subpart IIII**, Standards of Performance for Stationary Compression Ignition Internal Combustion Engines, applicable to units that commence construction after July 11, 2005 and are manufactured after April 1, 2006.

**401 KAR 61:015**, Existing indirect heat exchangers, applicable to an emissions unit with a capacity of less than 250 MMBtu/hr, which commenced before April 9, 1972.

##### **Emission Unit 01**

46.6 MMBtu/hr Coal-fired indirect heat exchanger  
Construction Commenced: 1956  
Control Equipment: Cyclone

##### **Emission Unit 02**

50.5 MMBtu/hr Coal-fired indirect heat exchanger  
Construction Commenced: 1963  
Control Equipment: Cyclone

The permittee shall conduct performance tests for PM, Hydrogen Chloride, and SO<sub>2</sub> within 180 of issuance of the final permit, for Emission Units 01 and 02. To preclude the applicability of 401 KAR 51:017, Prevention of Significant Deterioration of Air Quality, the sulfur content of coal burned in this unit shall not exceed 1.0% by weight.

##### **Emission Unit 03**

Two (2) natural gas indirect heat exchangers rated at 1.68 MMBtu/hr, each.  
Construction Commenced: 1968  
Control Equipment: None

##### **Emission Units 04 & 05**

Two (2) Natural gas-fired indirect heat exchangers, rated at 72.8 MMBtu/hr, each  
Construction Commenced: 1968  
Control equipment: None

Pursuant to 401 KAR 61:015, Section 4(1), particulate matter emissions shall not exceed 0.39 lb/MMBtu from each emission unit (EU 01-05), based on a 3-hour average.

Pursuant to 401 KAR 61:015, Section 4(3), visible emissions shall not exceed forty (40) percent opacity from emission unit (EU 01-05), except:

1. For stoker fired indirect heat exchangers, a maximum of sixty (60) percent opacity shall be permissible for not more than six (6) consecutive minutes in any sixty (60) consecutive minutes during cleaning the fire box or blowing soot
2. Emissions from an indirect heat exchanger during building a new fire for the period required to bring the boiler up to operating conditions provided the method used is that recommended by the manufacturer and the time does not exceed the manufacturer's recommendations

Pursuant to 401 KAR 61:015, Section 5(1), emissions of sulfur dioxide shall not exceed 6.0 lb/MMBtu from each emission unit (EU 01-05), based on a 3-hour average.

Pursuant to 401 KAR 52:020, Section 26, the permittee shall perform a qualitative visual observation of the opacity of emissions from each stack on a weekly basis and maintain a log of observations. If visible emissions are seen then the opacity shall be determined by using U.S. EPA Reference Method 9. If emissions are in excess of the applicable opacity limit, then an inspection shall be initiated of control equipment for any necessary repairs

Pursuant to 401 KAR 52:020, Section 26 and 401 KAR 61:015, Section 6, the permittee shall monitor and maintain records of the sulfur content (weight %) and heat content (lb/BTU) of each shipment of coal, and the hours of operation and fuel usage (tonnage) of each emission unit on a monthly basis.

#### **Emission Unit 06**

Forty-six (46) Natural gas-fired indirect heat exchangers rated less than 10 MMBtu/hr and greater than 1 MMBtu/hr (Heat input of all units combined: 103.5 MMBtu/hr)

Construction Commenced: After April 9, 1972

Control Equipment: None

#### **Emission Unit 07**

Natural gas indirect heat exchanger

Maximum continuous rating: 20 MMBtu/hr

Construction commenced: 1992

Control Equipment: None

Pursuant to 401 KAR 59:015, Section 4(1)(c), particulate emissions from each emission unit's stack shall not exceed 0.10 lb/MMBtu based on a three-hour-average.

Pursuant to 401 KAR 59:015, Section 4(2), emissions shall not exceed twenty (20) percent opacity from each emission unit's tack, based on a six-minute average except:

1. A maximum of forty (40) percent opacity shall be permissible for not more than six (6) consecutive minutes during in any sixty (60) consecutive minutes during cleaning the fire box or blowing soot.
2. During building a new fire for the period required to bring the boiler up to operating conditions provided the method used is that recommended by the manufacturer and the time does not exceed the manufacturer's recommendations.

Pursuant to 401 KAR 59:015, Section 5(b), sulfur dioxide emissions from each emission unit's stack shall not exceed 0.8 lb/MMBtu, based on a 3-hour average.

Pursuant to 401 KAR 52:020, Section 26, the permittee shall monitor and maintain records of the natural gas usage (scf) on a monthly basis.

### **Emission Unit 12**

Four (4) Diesel Generators rated at 200 kW, each.

Manufactured Date: After April 1, 2006

Controls: None

Hours of operation for each unit shall not exceed 500 hours per year based on a twelve month rolling total.

Pursuant to 40 CFR 60.4209(a), the owner or operator of an emergency stationary CI internal combustion engine, must install a non-resettable hour meter prior to startup of the engine.

Pursuant to 40 CFR 60.4207(a), the owner or operator of stationary CI internal combustion engine that uses diesel fuel must use diesel fuel that meets the requirements of 40 CFR 80.510(a).

Pursuant to 40 CFR 60.4207(b), beginning October 1, 2010, the owner or operator of a stationary CI internal combustion engine that uses diesel fuel must use diesel fuel that meets the requirements of 40 CFR 80.510(b).

Pursuant to 40 CFR 60.4205(b), owner and operators of 2007 model year and later emergency stationary CI internal combustion engines must comply with the emission standards for new nonroad CI engines in 60.4202, for all pollutants, for the same model year and maximum engine power.

Pursuant to 401 KAR 52:020, Section 26, the permittee shall monitor fuel usage (scf) and maintain records on a monthly basis.

The following units (EU 08, EU10 & EU11) **do not** have any applicable regulations due to size, and date of construction:

### **Emission Unit 08**

Twenty (20) Natural gas-fired indirect heat exchangers rated less than 1 MMBtu/hr

Construction Commenced: After April 9, 1972

Controls: None

These units are not subject to the applicable requirements of 401 KAR 59:015, because they are rated less than 1 MMBtu/hr. These units affect the source-wide limit on natural gas and the source-

wide limit on SO<sub>2</sub> so they are now listed as an emissions unit for clarity.

**Emission Unit 10**

Thirty seven (37) Natural Gas Fired Emergency Generators rated between 8 and 350 kW

Manufactured Date: Prior to January 1, 2009

Controls: None

Each unit is limited to 500 hours of operation per year, based on a consecutive twelve month rolling total.

These units are not subject to the applicable requirements of 40 CFR 60 Subpart JJJJ, because they were manufactured prior to January 1, 2009 and are emergency generators (§60.4230 (a)(4)(iv)). These units are listed as an emission unit for clarity because their emissions affect the source-wide limit on SO<sub>2</sub>. Any future natural gas generators that are added to the facility and are manufactured after January 1, 2009 will be subject to 40 CFR 60 Subpart JJJJ.

**Emission Unit 11**

8 Diesel Emergency Generators rated between 125 and 600 kW.

Manufactured Date: Prior to April 1, 2006

Controls: None

Each unit is limited to 500 hours of operation per year, based on a consecutive twelve month rolling total.

These units are not subject to the applicable requirements of 40 CFR 60 Subpart IIII, because they were manufactured prior to April 1, 2006 and are considered emergency generators (§60.4200 (a)(2)(i)). These units are an emission unit for clarity because their emissions affect the source-wide limit on SO<sub>2</sub>. Any future diesel generators that are added to the facility will be subject to 40 CFR 60 Subpart IIII.

**EMISSION AND OPERATING CAPS DESCRIPTION:**

To preclude the applicability of 401 KAR 51:017, Prevention of Significant Deterioration of Air Quality, total source-wide emissions of sulfur dioxide shall not exceed 225 tons per year based on a consecutive twelve month rolling total. To demonstrate compliance with this emission limitation, the consecutive twelve-month rolling total shall be calculated monthly and reported quarterly.

To preclude the applicability of 401 KAR 51:017, Prevention of Significant Deterioration of Air Quality, total source-wide usage of coal shall not exceed 10,000 tons per year based on a consecutive twelve month rolling total. To demonstrate compliance with this emission limitation, the consecutive twelve-month rolling total shall be calculated monthly and reported quarterly.

Total source-wide usage of natural gas shall not exceed 750,000,000 scf per year based on a consecutive twelve-month rolling total. The permittee shall monitor and maintain records of source-wide natural gas usage on a monthly basis. To demonstrate compliance with this emission limitation, the consecutive twelve-month rolling total shall be calculated monthly and reported quarterly.

**CREDIBLE EVIDENCE:**

This permit contains provisions which require that specific test methods, monitoring or recordkeeping be used as a demonstration of compliance with permit limits. On February 24, 1997, the U.S. EPA promulgated revisions to the following federal regulations: 40 CFR Part 51, Sec. 51.212; 40 CFR Part 52, Sec. 52.12; 40 CFR Part 52, Sec. 52.30; 40 CFR Part 60, Sec. 60.11 and 40 CFR Part 61, Sec. 61.12, that allow the use of credible evidence to establish compliance with applicable requirements. At the issuance of this permit, Kentucky has only adopted the provisions of 40 CFR Part 60, Sec. 60.11 and 40 CFR Part 61, Sec. 61.12 into its air quality regulations.